

BEARING & BUSHING PORTABLE ROLLER SWAGING TOOL INSTRUCTIONS

ORDER OF PRECEDENCE:

In the event of a conflict between this text and the Airframes Manufacturing Procedures, the Airframes Manufacturing Procedures take precedence.

BEARING REMOVAL PROCEDURE:

Where the housing material is 150 KSI UTS or more, the swaged bearing may be pressed out without the use of a cutting tool. Where the housing material is less than 150 KSI UTS, the following procedure shall be used to prevent damage to the housing. Only one swaged side of the Bearing will need to be cut.

1. Select the proper Portable Swaged Bearing Cutter Tool. Check the tools condition, if it is damaged, severely worn, or there are dull or missing teeth replace tool.
2. Refer to figure 1; remove the Flange Nut and Seat from the tool. Place the Portable Bearing Cutter Shaft through the Bearing, carefully align the cutting teeth within the swaged bearing's lip and hold in place.
3. Place the Portable Bearing Cutter Seat and Flange Nut on Shaft extending from opposite side of bearing. Tighten the Flange Nut while aligning Seat with opposite swaged bearing's lip until snug.
4. Tighten the Portable Bearing Cutter Spring Tensioner Nut and/or the Flange Nut until an adequate amount of pressure is place upon the cutting teeth. Only a small amount of pressure should be necessary. Be sure that the cutting teeth are within the swaged bearing's lip, at approximately the same diameter as the bearing before swaging occurred. Place the Portable Bearing Cutter Spanner Wrench onto the Cutter Head and rotate clockwise to begin cutting a groove in the swaged bearing's lip. Continue rotating the Cutter head until the groove has cut through approximately 80% of the bearings swaged lip. Exercise extreme care not to cut completely through the bearing's lip to prevent damaging the Bearing Housing.
5. Select the proper Portable Bearing Install and Removal Tool. Check the tools condition, if damaged or severely worn replace tool.
6. Press bearing out of the housing with the Removal part of Tool per figure 2. Discard old Bearing; it can not be used again.

PRIOR TO BEARING INSTALLATION:

1. Inspect for proper part numbers on bearing and housing per engineering drawing. Clean housing bore as necessary to remove all foreign particles, corrosion, and contamination prior to installing the bearing. Check the Bearing Housing bore and chamfers to ensure there are no burrs or damage. If the Housing is damaged it can not be used.
2. Check the bearings to assure that they are clean and free from contamination. If bearings require cleaning, clean as necessary following manufacturer's recommendations. Re-lubricate metal-to-metal bearings with appropriate grease as required by the bearing drawing. Do not lubricate self-lubricated bearings.

RED BARN MACHINE
190 S. DANEBO AVE. Eugene, Oregon 97402
(541) 344-9953; fax (541) 344-3863
e-mail; sales@redbarn.net

RED BARN MACHINE	
TITLE	PORTABLE BEARING TOOLS MANUAL
	SHEET 1 of 5

PRIOR TO BEARING INSTALLATION CONT.

3. Apply proper corrosion protection coating to the housing bore and/or bearing O.D., prior to installing the bearing, as required by the applicable finish specifications and MIL-STD-1599, Requirement 105. Do not install bearings wet with corrosion protection where corrosion protection could interfere with re-lubrication provisions. After installation and swaging such bearings, the bearing to housing interface shall be coated with corrosion protection as required by the applicable finish specifications. If passages are provided to re-lubricate metal-to-metal bearings, verify they are open.

BEARING INSTALLATION:

1. Select the proper Portable Bearing Installation Tool. Check the tools condition, if damaged or severely worn replace tool.
2. Press the bearing into the housing taking care to assure that the bearing is straight and not canted to the housing bore during insertion per figure 3. Check to assure the bearing is not canted in the housing and that the bearing will rotate within the torque limits specified on the engineering drawing.
3. If an interference fit exists between the bearing and the housing bore, take extreme care in aligning the bearing with the housing bore prior to pressing it into the housing. Bearings that are canted while pressed into the housing are easily deformed.

SWAGING OPERATION:

1. Select the proper Portable Bearing Swaging Tool. Check the tools condition, if damaged or severely worn replace tool. Check Swaging Tool's bronze Roller Carriage and Rollers, Carriage must be slightly loose and Rollers turning freely. Adjustments can be made by the lock nut inside the Swaging Assembly per figure 4.
2. Check the assembly to assure the bearing is properly centered in the housing.
3. Separate the Portable Bearing Swaging Tool's three main parts, the Tensioner Assembly, Seat, and the Swaging Assembly per figure 4. Place the Seat into the Tensioner Assembly housing with the Primary side facing out.
4. Apply a thin coat of light lubricant to bearing groove to prevent galling if required. Put the Swaging Assembly's Shaft through the bearing, align the Swaging Assembly's three Rollers edges with the bearing's groove, and place against bearing and hold in place. Put the Tensioner Assembly and Seat (with the Primary side out) onto the Swaging Assembly's Shaft that sticks out of the Bearings other side. Align the Tensioner Assembly's Guide Pin with the flat surface on the Swaging Assembly's Shaft and tighten the Tensioner Assembly nut until sufficient pressure to start swaging procedure is acquired per figure 5.
5. Rotate the Swaging Assembly by the assembly's Nut cap in a clockwise rotation only, (counter clockwise will loosen cap and possibly shaft locknut). Rotate Swaging Assembly continuously, occasionally tightening Tensioner Nut to keep sufficient pressure applied to the Bearings Groove Lip for swaging.

Roller swaging requires a relatively light load compared to anvil swaging. There are no tabulated swaging loads for using the Portable Swaging Tool. Use minimum swaging force necessary to meet requirements and to avoid lip or housing damage. Variations in groove dimensions and bearing race material hardness can cause the swaging load or duration of application to vary. In most instances, the operator of the Portable Roller Swaging Tool will develop a sense of the load and duration of application needed for proper bearing swaging after a few operations with these tools.

RED BARN MACHINE

190 S. DANEBO AVE. Eugene, Oregon 97402

(541) 344-9953; fax (541) 344-3863

e-mail; sales@redbarn.net

RED BARN MACHINE	
TITLE	PORTABLE BEARING TOOLS MANUAL
	SHEET 2 of 5

SWAGING OPERATION CONT.

6. Continue process No. 5 while visually checking the amount of material swaged until proper swaging has been achieved per figure 6. If it is a Flanged Bearing being swaged, with a groove on one side only, skip process No. 7 and move on to process No. 8.
7. Remove the Portable Roller Swaging Tool from the Bearing and Housing. Reverse the Seat so that the Secondary side is away from the Tensioner Assembly Housing. Repeat processes No. 4 through No. 6, making sure that the Secondary side of the Seat aligns with the previously swaged groove of the bearing.
8. After swaging is completed on each side of the Bearing and Housing, visually determine that the lips have been swaged over the housing properly and check edge gap as shown in figure 6. Re-swage, if necessary, at higher swaging loads until the edge gap condition is met. Inspect each swaged lip for damage such as cracks, chips, galling, etc.

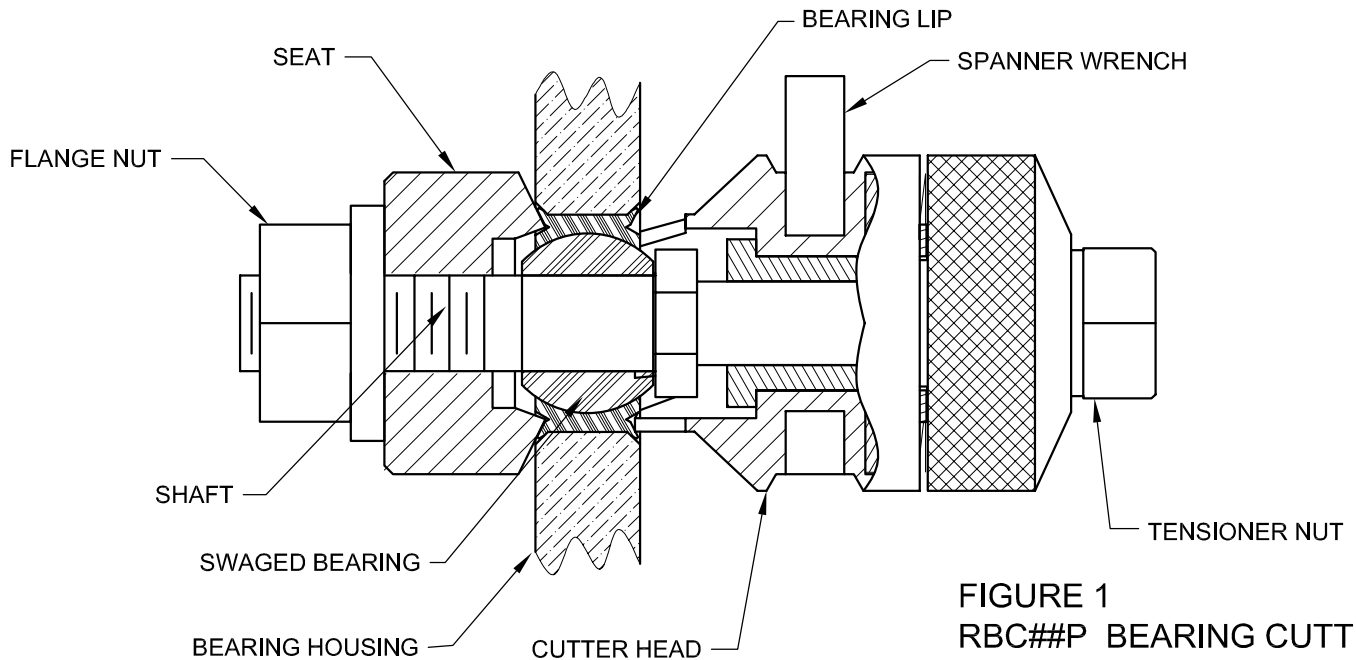


FIGURE 1
RBC##P BEARING CUTTER

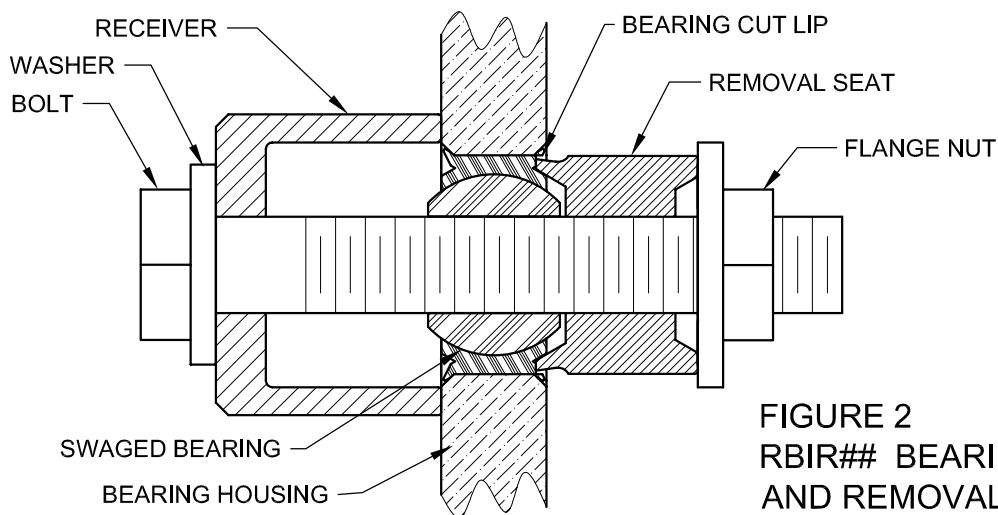


FIGURE 2
RBIR## BEARING INSTALL
AND REMOVAL TOOL

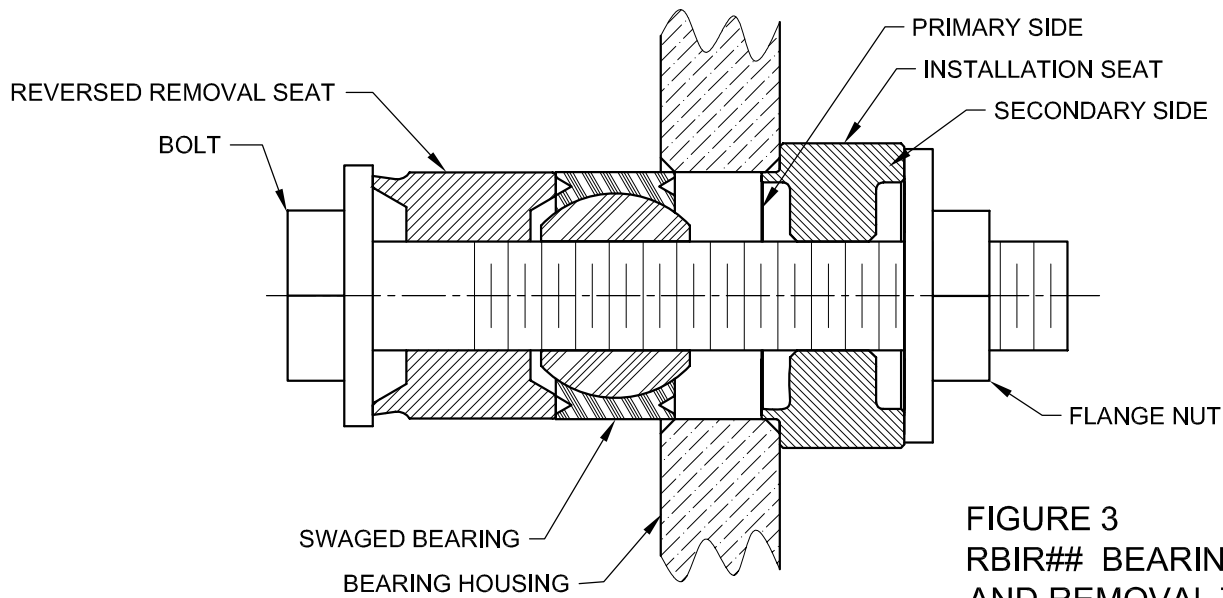


FIGURE 3
RBIR## BEARING INSTALL
AND REMOVAL TOOL

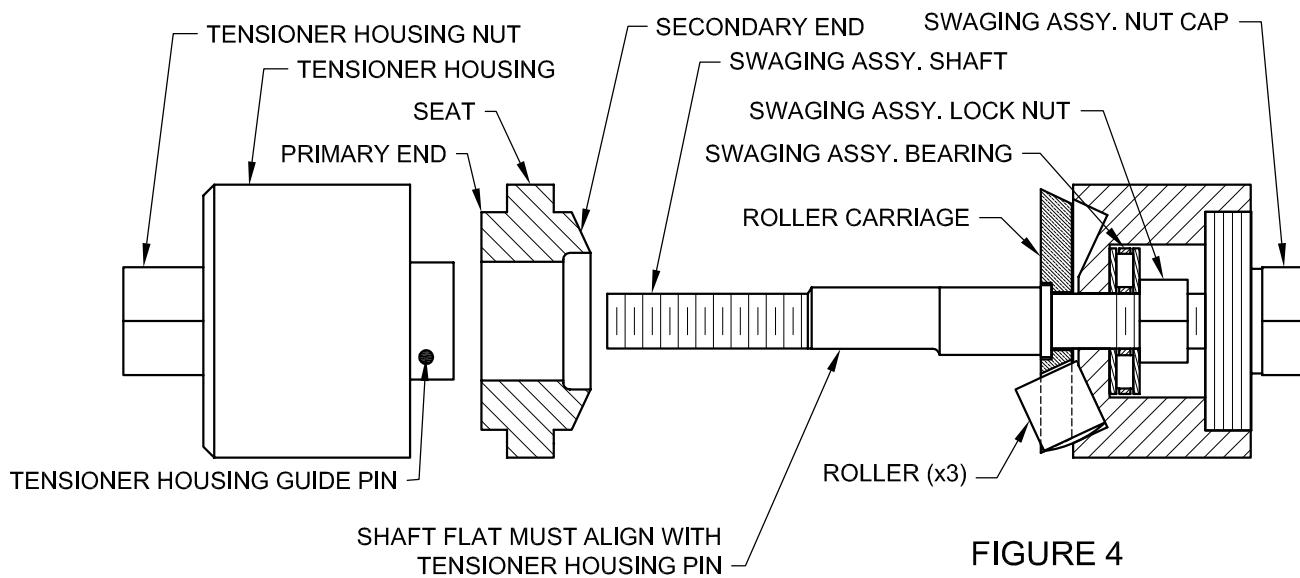


FIGURE 4
RBST##P PORTABLE
BEARING SWAGING TOOL

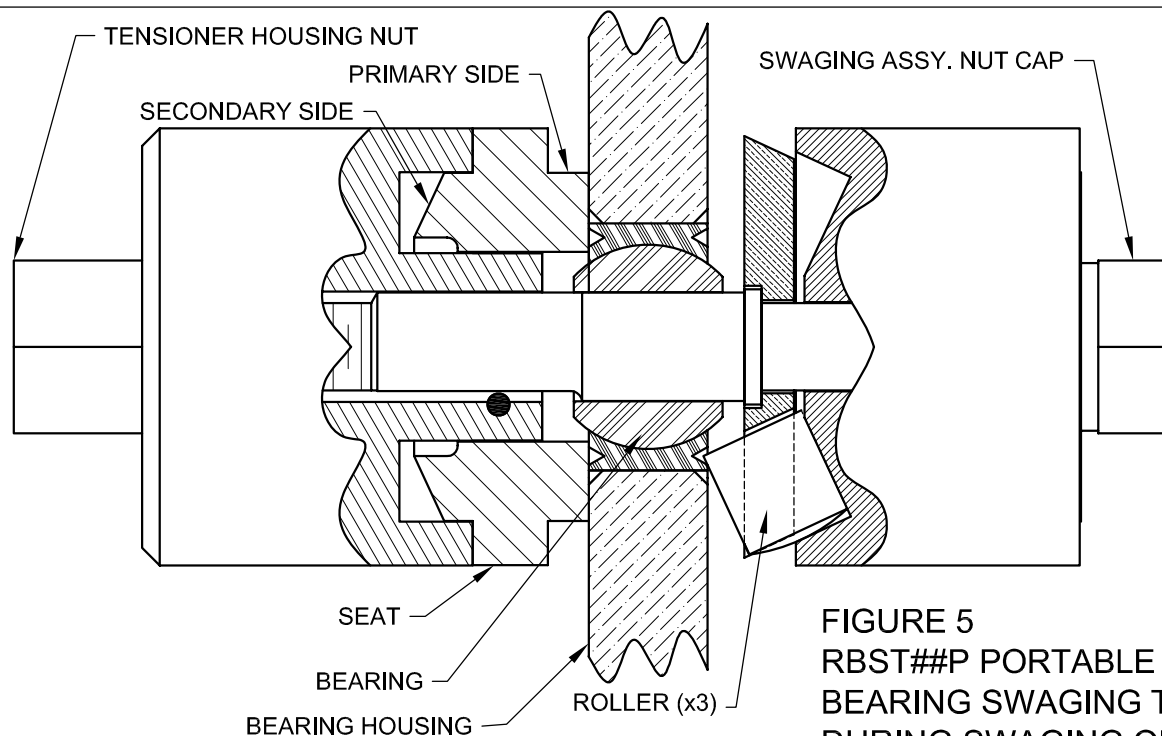
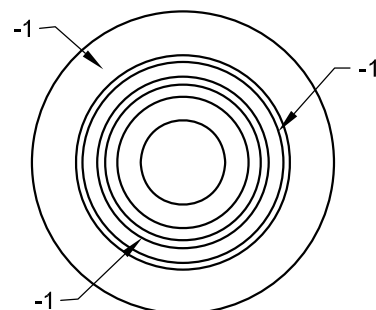
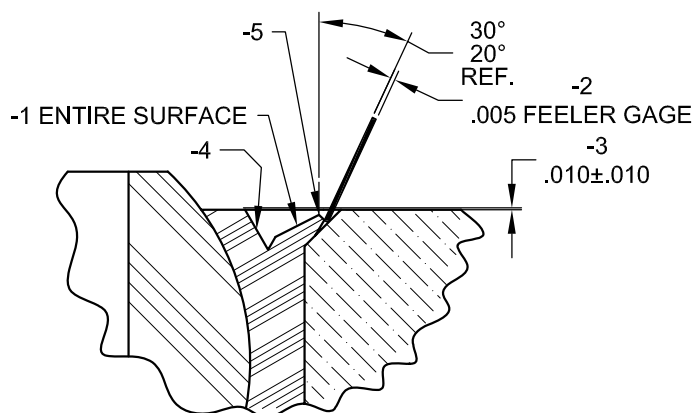


FIGURE 5
RBST##P PORTABLE
BEARING SWAGING TOOL
DURING SWAGING OPERATION



Inspection of swaged V-groove Bearings shall be as follows:

- 1 Visually inspect this circumferential area for cracks and separations.
- 2 Inspect circumference of the gap in the swaged lip as shown with .005 in. feeler gage. A properly swaged bearing in an optimally prepared housing will not accept the feeler gage, however, no more than 40% of the circumference may accept the gage. Inspect while installation treatment is uncured.
- 3 Bearing race face to be flush with housing within $\pm .010$ in.
- 4 Visually inspect inner face of bearing groove to assure there is no evidence of roller contact during the swaging operation.
- 5 Visually inspect the swaged portion of the swaged lip to assure that over-swaging has not occurred.

FIGURE 6
INSPECTION

RED BARN MACHINE
 190 S. DANEBO AVE. Eugene, Oregon 97402
 (541) 344-9953; fax (541) 344-3863
 e-mail; sales@redbarn.net

 RED BARN MACHINE	
TITLE	PORTABLE BEARING TOOLS MANUAL
SHEET	5 of 5